METU Studies in Development, 43 (April), 2016, 289-315

Dynamic analysis of employment and domestic value added generated by foreign demand in Turkey

Sevinç Mıhçı
Hacettepe University, Department of Economics, Beytepe Campus, Ankara, Turkey
e-mail: sevinc@hacettepe.edu.tr

Arzu Akkoyunlu Wigley
Hacettepe University, Department of Economics, Beytepe Campus, Ankara, Turkey
e-mail: arzus@hacettepe.edu.tr

Başak Dalgıç
Hacettepe University, Department of Public Finance, Beytepe Campus, Ankara, Turkey
e-mail: basakcakar@hacettepe.edu.tr

Abstract

The aim of this paper is to analyze the change in the employment generation potential of exports at the sectoral level for recent years by using the input-output methodology. Indirect and direct "wage-share" of one unit of exports are estimated by using the input-output table of 2002 and the sectoral Trade in Value Added (TiVA) statistics. Our estimation results show that the average wage content of one unit of exported product, which is used as a proxy for the employment generated by exports, decreased between the years 1995 and 2008. The falling domestic value added (DVA) component of exports is responsible for this weakening role of exports in employment generation. The firm level data indicate similar results in terms of the direct domestic value added and employment effects of exports for the period 2003-2012. However, the firm level data also suggest the possibility of an increase in the indirect domestic value added and employment generated by exports due to the decrease in the imported intermediate input content of output by exporter firms in recent years.

Key words: Exports, domestic value added, employment, input-output analysis.

JEL codes: D57, F14, F15, F16, F66.

1. Introduction

Among the most important and often cited features of the rise in globalization is the enormous growth in the export and import shares of GDP since World War

II. While the share of the sum of imports and exports to the world GDP is equal to 39% in 1980, it climbed to 61.5% in 2013 (UNCTAD, 2015). For many economies today especially in Asia, imports are key complements of local production and exports (Elms and Low, 2013). The characteristic of trade has evolved to the point where countries increasingly specialize in producing particular stages of a good, rather than producing finished goods with all steps. Hence, fragmentation in the production of certain goods became both the cause and the result of this globalization process. International trade has been increasingly arranged by so called Global Value Chains (GVCs) where the different stages of the production process are located across different countries. Turkey is also part of the GVCs in many respects. Rapid export growth was one of the targets of the trade liberalization policy reforms, which was initiated in 1984 and continued during 1990s. As a result, Export-to-GDP ratio has increased from 19.89% in 1995 to 25.64% in 2013 (World Bank, 2015). Similarly, Import-to-GDP ratio has increased from 24.35% in 1995 to 32.20% in 2013 (World Bank, 2015).

Average growth rate of the value of exports in Turkey was also very high during the 1995-2013 period (Table 1). Similar to the world trend, growth rate of exports was higher than that of GDP for this period (Table 1).

Table 1
Selected Macroeconomic Indicators of Turkey, 1995-2013 (Average, %)

	1995-2000	2000-2005	2005-2010	2010-2013
Export-to-GDP	21.15	23.53	22.55	24.28
Rate of Growth of export ($)	11.06	8.79	3.82	6.82
Growth of GDP	4.76	5.05	4.16	6.05
Unemployment rate	7.02	9.53	11.33	10.30
Import-to-GDP	24.19	24.26	26.66	30.77
Rate of Growth of Import ($)	15.49	12.40	5.33	9.99

Source: World Bank, 2015.

In contrast to the positive performance of the Turkish economy in terms of its exports and GDP, the unemployment rate had an increasing trend with very high rates during the same period. The positive linkages among employment, output and the exports suggested by traditional theories are not revelaed by the data for this period. This paradox is not peculiar to Turkey. Both world trade volume and number of unemployed people reached record levels in many countries in recent years (ILO, 2015). Therefore, the role of exporting activity in generating employment became the focus of both theoretical and empirical research agendas as well as an important policy issue.

Since GVCs gave rise to increased trade through exports and imports, this significant rise in the fragmentation in production of various goods across different countries has led economists to develop new methods to analyze trade statistics when measuring a country's export performance and the contribution of its exports to domestic product and employment growth (De Backer and Yamano, 2007; Elms and Low, 2013). Trade in intermediary goods has increased in all regions since 2002. It was valued at over $7 trillion in 2011 and accounts for about 40 per cent of world trade (UNCTAD, 2015). Similarly, the foreign content share in gross exports on average has almost doubled since 1970 (IMF, 2013). These empirical facts placed some doubt on the employment generating capacity of export demand. It is argued that globalization and the increasing number of product chains by causing a rise in foreign content of exports may cutback the power of exporting on growth and employment generation. On the other hand, there are also studies that show GVCs can create more employment opportunities by raising the productivity and competitiveness of firms. Therefore, the main emphasis of the recent theoretical and empirical literature addressing the employment effects of GVCs is the extent of the domestic value added contained in exports.

Although there are already some studies investigating the relation between exports and employment in Turkey, to the best of our knowledge there is no study that examines the employment creation capacity of exports by calculating the domestic and foreign value added content of exports using the input-output methodology as well as firm level data. Therefore, the aim of this paper is to analyze the change in the employment generation potential of Turkish exports at the sectoral level for the recent years by calculating the domestic value added of exports via input-output methodology. With this aim, the direct and indirect domestic value added generated by exports as well as the indirect and direct "wage-share" of one unit of exports will be estimated at sectoral level based on the most recent input-output table of 2002 by TURKSTAT and the sectoral Trade in Value Added (TiVA) statistics of OECD-WTO for the years 1995, 2000, 2005 and 2008. Dynamic change in the value added and employment generation capacity of exports in the Turkish economy will also be analyzed descriptively by using the firm level data collected by TURKSTAT for the years 2002 and 2013. Hence, this study is expected to contribute to the limited literature on exports, GVCs and employment relation for developing countries.

The remainder of this paper is organized as follows. In the second part of the study, the theoretical and empirical literature focusing on the relationship between exports, GVCs and employment will be briefly introduced. In the third part of the study, the data set and the methodology of the study will be presented. The results of the study are presented in the fourth part of the study. Section five concludes.

2. Export, global value chains and employment: Theoretical framework and empirical studies

It is accepted that Heckscher-Ohlin model predicts employment growth in developing countries since the increase in trade raises the demand for labor-intensive products in labor-surplus countries. As it is well known, the Heckscher-Ohlin model is based on clearance of all markets with macroeconomic equilibrium and full employment; therefore, a rise in trade can only cause an inter-sectoral shift towards labor-intensive activities (Lall, 2002). Due to the "full employment" assumption in the long-run, traditional theory only focuses on the allocation of employment across sectors (Shingal, 2015).

However, unlike the predictions of the traditional theory, theoretical models focusing on labor market frictions shows that there might be a temporary increase in unemployment following trade liberalization (Hoekman and Winters, 2005). Similarly, contrary to the traditional trade theory, new trade theory does not produce unambiguous predictions for employment since the specific pattern of comparative advantage is indeterminate and opening up to trade does not show how factor use will change (Lall, 2002).

Together with the recognition of the GVCs, development of new-new trade theory based on firm heterogeneity and fixed-market entry costs, introduced new dimensions specifically into the trade-employment relationship. Within the framework of new-new trade theory, Melitz (2003) shows that aggregate productivity and employment increase following trade liberalization. In a similar vein, Bernard and Jensen (2004) finds that employment and output growth rates are much higher for exporters and employment growth continues to increase after entry into foreign markets.

On the other hand, UNCTAD (2013) points out that gross export figures do not represent value addition, since many imported intermediate goods and services are used in production processes. Gross trade may therefore not be linked closely to employment (high foreign inputs are observed in core manufacturing subsectors, electrical optical equipment, transport equipment and machinery and equipment). Accordingly, employment is more responsive to the value added in exports than in gross exports i.e. one percent higher value added of exports causes 0.53 percent higher employment in manufacturing, for gross export it is 0.47 percent (UNCTAD, 2013). Because of the dramatic increase in the international fragmentation of production processes, the main emphasis of the recent literature addressing the employment effects of GVCs is not only the direct effect of exports on aggregate demand but also the extent of the domestic value added contained in exports to measure the employment generation capacity of export. Therefore, estimation of the "job content" of trade should be directed to the value added of trade where

exactly jobs are created. Traditional thinking in gross export terms would regard imports of a product in another country as importing country loses jobs (Ahmad, 2013:89). Emphasizing the fact that fragmented production processes keeps costs low and companies competitive, Ahmad (2013) points out that even though workers may have indeed lost their jobs in the importing country at the assembly stage, value-added-based measures would have highlighted the important contribution made by those working in the research, development, design and marketing activities that exist because of trade.

The measurement of the DVA component of exports to evaluate the employment generation capacity of exporting activity is the key focus of this literature. Additionally, Jiang and Milberg (2013) points out that foreign labor contained in exports, domestic labor contained in imports as well as the third-country labor contained in country's import should also be considered to evaluate the employment impact of export. Therefore, with value added trade, the relationship between trade and employment becomes more complicated (Shingal, 2015).

Most of the recent studies focusing on the GVCs and employment relation conclude that GVCs increase aggregate and long-term employment through reallocation of tasks across and within countries (Shingal, 2015). One of the channels to increase employment is the increase in the productivity of offshoring firms that causes an increase in sales and employment (Görg, 2011; Shingal, 2015). Similarly, Newfarmer and Sztajerowska (2012) conclude that trade in tasks increases the employment by raising the productivity as a result of the specialization. IMF (2013) points out another channel; the decrease in the prices of intermediate and final goods, which in turn increases the employment via decrease in cost and increase in final demand.

On the other hand, some studies show that GVCs participation mainly affects the reallocation of jobs between countries and sectors. Labor-intensive manufacturing jobs moves from developed countries to low-wage developing countries and this causes a reallocation of jobs between countries (IMF, 2013). GVCs also cause reallocation of jobs within countries across different sectors when the comparative advantage of countries is refined in terms of tasks (Grossman and Rossi-Hansberg, 2008). Accordingly, these reallocations cause short-term unemployment for low skilled workers (Shingal, 2015).

In sum, a recent survey on the labor market effects of GVCs show that GVCs may create more employment opportunities, income gains for workers and better working conditions (Shingal, 2015). However, this study also indicates that benefits depend on the position of the firm in the value chain and might contribute to the skilled-unskilled labor division (Shingal, 2015:1).

The number of empirical studies measuring the employment effects of GVCs started to increase because of the increase in the number of theoretical studies focusing on the GVCs-employment relation. In addition to the other advantages, since the trade in value added measures also lead to a more refined identification of the relationship between exports and employment, there is a growing body of work using the value added based measures to identify the domestic/foreign content of exports.[1] In a pioneering study Hummels et al. (2001) propose a method to decompose a country's exports into domestic and foreign value added share based on a country's input–output (I/O) table with the assumptions that imported input intensity is the same between production for exports and production for domestic sales and imports are 100 percent foreign sourced. Koopman et al. (2008, 2010) argue that the first assumption does not hold because of the processing exports. Therefore the measures suggested by Hummels et al. (2001) tend to underestimate domestic content share in exports (Koopman et al., 2012:4). In order to overcome inaccuracies in the measures suggested by Hummels et al. (2001) recent research focuses on estimating the value added based measures by using the global inter country Input-Output (ICIO) tables based on the GTAP database. Among these studies, Koopman et al. (2010, 2012) defined a new methodology by decomposing value-added trade into three components. The first component is the domestic value-added in the country's final goods exports; the second component is value-added in the country's intermediate goods exports used by the direct importer to produce final goods consumed by the direct importer and, the third component is value-added in the country's intermediate exports used by the direct importing country to produce final goods for third countries.

There are also studies focusing on both DVA as well as the employment generated by exports. A pioneering study on this topic, Chen et al. (2009) used an input-output methodology to estimate China’s DVA and employment generated by its exports. Following this study, the most common methodology in other studies to estimate the DVA and employment generation is to employ input-output methodology.

By fragmenting inputs as foreign and domestic, input-output modeling makes it possible to differentiate the domestic content of exports. Additionally, by means

[1] Other advantages of evaluating the trade from the value added perspective are as follows. First of all, the amount of domestic value added (DVA) generated by the export is crucial for understanding the relationship between trade, growth and competitiveness. Secondly, it also enables to take into account the domestic value-added found not only in exports but also in imports. Another advantage of evaluating trade from value added perspective is that the contribution of the upstream domestic industries e.g. service industries become possible to identify. It also provides better assessment of trade imbalances in terms of surpluses and deficits across partner countries as well as the better assessment of the environmental impacts of trade (Ahmad, 2013: 88-90).

of input-output modeling domestic exports can be classified as direct and indirect exports. Direct exports are the goods sold to other countries; indirect exports are the domestically produced inputs incorporated in direct exports. It is claimed that direct effects are only the 'tip of the iceberg'. According to the estimations of Chen et al. (2012) for the Chinese economy, indirect effect of export on domestic value added is approximately double of direct effect. The magnitude of indirect exports in any given economy depends on the intensity of the domestic inter-sectoral linkages in its productive system. The more intense both backward and forward linkages are, the greater indirect exports will be. Therefore, techniques based on input-output modeling permits tracing of exports throughout the economy. It becomes possible to measure the entire domestic content (i.e. domestic value added embodied in exports directly and indirectly). Hence, by using input-output modeling whole multiplier effects of exports on output and employment can be observed.

Using the input-output methodology, Dean et al. (2007), Feenstra and Hong (2007), Koopman et al. (2008) and Chen et al. (2012) estimated the domestic value added and employment generated by exports. Among these studies, Feenstra and Hong (2007), Koopman et al. (2008), and Chen et al. (2012) also made a distinction between processing and non-processing exports. Cappariello (2012) calculated the domestic value added generated by exports and proxy for the labor share for Germany, Italy and France by using the input-output method.

Feenstra and Hong's (2007) study is on Chinese economy for the period 1995-2002. One of the main findings of Feenstra and Hong (2007) is the higher employment generation capacity of domestic demand relative to the exports. In the same vein, they show that composition of exports is changing towards the sectors where productivity is high and therefore labor demand is low. Cappariello (2012) shows that, although the domestic value added of exports increased for these three countries Germany, France and Italy, the shares in GDP decreased for the related period 2000-2007. Among these countries, domestic wage content of manufacturing exports is the highest in Germany. In his work on Czech Economy over the period 2000-2008, Rojicek (2009) shows that, the import intensity of exports in the economy increased on average between 2000 and 2005. However, according to the results of this study, employment generation capacity of exports increased slightly for the same period. Gambero and Martinez (2013), examined the domestic value added generation capacity of exports on Mexican economy by means of input-output methodology. They showed that the biggest share of domestic value added in exports is direct, which indicates that linkages between the exporting sectors and the rest of the economy are relatively weak for the year 2003. These weak linkages are nothing but the higher imported input share of domestic production.

Another recent study, Jiang and Milberg (2013) by using the World Input-Output Database for 39 countries shows that 14% of the total trade generated jobs in 2009 generated as a result of the integration into GVCs. Similarly, review of some case studies also shows an employment gain because of the GVCs participation in Vietnam, Bangladesh, Kenya and South Africa (Shingal, 2015).

3. Data set and the methodology of the study

As it is mentioned before, the aim of this paper is to analyze dynamically the employment generation potential of Turkish exports at sectoral level by means of DVA via using the input-output methodology. Input-output (IO) methodology (Leontief, 1986) is widely accepted due to its ability to estimate both direct and indirect effects of exports on DVA by accounting for international and inter-industry flow of the global production process (Hummels et al., 2001; Koopman et al., 2012; Chen et al., 2012; Jiang, 2013). For this purpose, firstly we obtain the DVA generated by one unit of export demand for each sector (DVA_X). As a second step, in order to evaluate the employment generating effects of exports, we calculate labor content of each unit of DVA_X of each sector for related years. According to the method used by Feenstra and Hong (2010);

$$DVA_X = A_V^X + DVA_X * A^{DX} \quad (1)$$

$$DVA_D = A_V^D (I - A^{DD}) \quad (2)$$

where, A_V^X: Vector of direct value added of one unit of export; DVA_D: Total domestic value added (direct and indirect) of one unit of domestic production; A^{DX}: (nxn) matrices of direct input requirement of domestic product for one unit of export; A_V^D: Vector of direct value added of one unit domestic production; A^{DD}: (nxn) matrices of direct input requirement of domestic product for one unit of domestic production.

Since in the national input-output tables, only compensation to employees and value added of each sector are provided, in order to estimate labor content of each unit of, DVA_X "wage-share" of equation (3) is used as a proxy for the labor content following Feenstra and Hong (2007) and Cappariello (2012). This share shows us how many units of wages exist within one unit of value added.

$$wageshare = (compensation\ of\ employees)/(value\ added) \quad (3)$$

Hence, when we calculate the DVA_X of each sector and related "wage-share" of each sector,

$$wageshare\ of\ export = DVA_X * wageshare \quad (4)$$

Equation (4) provides an estimation of total (direct + indirect) wage payments or employment, resulting from one unit of export demand for each sector. In other words, the domestic employment generated by one unit of export demand is estimated by taking into account the inter-industry flow of the production process.

Since A^{DX} and A_V^X are not issued and therefore not available for Turkish economy for any year, we use the domestic value added (DVA_X) of each unit of export (total value added share of gross exports) provided by OECD-WTO sectoral Trade in Value Added (TiVA) statistics for the years 1995, 2000, 2005 and 2008 and for 18 sectors. We calculated the total value added (DVA_D: direct+ indirect) by using equation (2) and total compensation payment (direct+ indirect) of employees of each industry based on the latest available 2002 input-output table for the Turkish economy.[2] As a next step, "wage-shares" are calculated. Furthermore, it is assumed that "wage-share" in each sector is constant for the years 1995, 2000, 2005 and 2008 at their level in the year 2002 when the latest input-output table was released.

As long as the real wages are stable during the period of analysis, the wage share is a reliable indicator of employment variable. As can be seen in Table 2, from 2003 to 2008 the average annual real wage in the manufacturing sector, despite the negligible increase, can be considered as stable. Therefore, "wage-share" provides us with valid proxies for employment variable.

[2] Sectoral,total compensation payment of employees is obtained by the equation " compensation= $\frac{W}{A_V^D}(I - A^{DD})$" where W: compensation payment vector, A_V^D: vector of direct value added of one unit domestic production, A^{DD}: (nxn) matrices of direct input requirement of domestic product for one unit of domestic production.

Table 2
Average Sectoral Annual Real Wages (2003 base year)

Sectors	2003	2008
Mining and quarrying	16139	15171
Food products, beverages and tobacco	16194	15303
Textiles, textile products, leather and footwear	5578	6158
Wood, paper, paper products, printing and publishing, manufacturing not nec. Recycling	8310	9549
Chemicals and non-metallic mineral products	21227	23489
Basic metals and fabricated metal products	11530	11038
Machinery and equipment, nec.	12872	12309
Electrical and optical equipment	12815	13692
Transport equipment	16699	14116
Electricity, gas and water supply	21803	21143
Manufacturing sector average	13469	13790

Source: Calculated by authors by using the firm level data collected by TURKSTAT.

Notes: To calculate nominal wages, total wage payment of each sector is divided by total number of employees in this sector. In order to get real wages, CPI is used as a deflator.

Although there are 59 sectors in input-output tables, DVA_X is available only for 18 sectors. Sectoral export data is available for 34 sectors. Since there is no one-to-one correspondence between sectoral classification of input-output table, DVA_X statistics and export data, we had to make conversion in order to harmonize these data sets. The harmonization became possible in the case where the sectors are aggregated into 10 sectors. By making necessary conversions and aggregations, the input-output table for the year 2002 is reconstructed based on 10 sectors classification. Accordingly DVA_X and "wage-share" are calculated for all 10 sectors. As a last step, "wage-share of export" ($DVA_X * wageshare$) is calculated for all sectors.

In addition to the above mentioned analysis using input-output methodology at sectoral level, firm level data for years 2003 and 2012 are examined comparatively in terms of related indicators to clarify the employment and value added generation capacity of Turkish exports. In order to differentiate the capacity of the export from the domestic production, firm level data are summarized for exporting firms and non-exporting firms for 49 sectors. Indicators calculated by using firm level data both for exporting and non-exporting firms are labor per unit of output (L/Q), value added per unit of output (VA/Q) and imported intermediate inputs per unit of output (Minput/Q). "L/Q" is chosen for observing employment generation capacity of both type of firms over the period

under consideration. "V/A" is chosen for evaluating the direct value added effects. "Minput/Q" is adopted as an indicator of the indirect value added creation capacity of the sectors. Change in the value of these indicators from 2003 to 2012 are calculated to make dynamic comparative analysis. To do so we utilize two different sources of data collected by TURKSTAT: Annual Industry and Service Statistics with Annual Trade Statistics. In the Annual Industry and Service Statistics firms are classified according to their main sector of activity, as identified by NACE Rev.1.1 standard codes for sectoral classification and the economic activities that are included are NACE sections C to K, and M to O. This database provides detailed information on number of structural variables which are mainly seen on a firm's balance sheet such as revenues, value added, labor cost, intermediate inputs cost, tangible and intangible investment costs together with information on geographical location, foreign ownership and the number of employees. All nominal values are deflated by using 4-digit NACE price indices with the base year 2003. The Foreign Trade Statistics consists of the imports and exports at 12-digit GTIP classification the first 8 digits of whom correspond to CN classification whereas the last 4 digits are national enabling us identifying the imported intermediates.

4. Results of the study

Table 3 shows the "wage-share of exports" at sectoral level for the years 1995-2008. Table 3 points out that "wage-share of exports" steadily declined in every sector between 1995 and 2008. The most dramatic decrease occurred in electricity, gas and water supply (30%), chemicals and non-metallic mineral products (25%) and basic metals and fabricated metal products (21%). The "wage-share of exports" has decreased even in the traditional export sectors that Turkey has a comparative advantage, such as textiles, textile products, leather and footwear.

Table 3
Wage-share of Exports (1995-2008, %)

	1995	2000	2005	2008
Agriculture, hunting, forestry and fishing	15.98	15.51	15.63	15.35
Mining and quarrying	36.52	34.50	34.06	33.55
Food products, Beverages and tobacco	21.75	20.73	20.95	20.10
Textiles, textile products, leather and footwear	31.92	30.87	30.80	30.32
Wood, paper, paper products, printing and publishing, manufacturing not nec. Recycling	32.08	28.71	26.50	25.36
Chemicals and non-metallic mineral products	30.34	28.43	24.57	21.17
Basic metals and fabricated metal products	30.53	28.02	24.18	22.11
Machinery and equipment, nec.	33.39	30.99	28.70	27.54
Electrical and optical equipment	35.01	29.90	29.56	29.07
Transport equipment	39.44	35.45	33.08	32.72
Electricity, gas and water supply	21.18	19.66	15.36	13.74

Source: Our calculations based on the OECD-WTO, TURKSTAT data.

In order to estimate overall effect of exports, as a more comprehensive indicator, average "wage-share of exports" for each year is calculated by using the exports shares as weights. Table 4 shows that average "wage-share of exports" has decreased during the study period. Share of total wage payments is 29% in one dollar worth export in 1995. In other words, a one unit increase in export demand, when we consider the both direct and indirect value added effects, at the end create a 0.29 unit increase in wage payments. This ratio dropped down to 25.37% in 2008. This decline might be due to changes in three components namely "wage-share", DVA_X and the export shares of each sector.[3] Since we assume that "wage-share" is constant for all years, DVA_X and export shares can be responsible for this shift. There might be a decrease in the value added part because of changing techniques, input requirements and/or import content of inputs, besides a change in the composition of export against sectors where the "wage-share" is low. In order to test which reason is realized for the Turkish case two more indicators are calculated. Firstly, sectoral export share is kept constant and average "wage-share of exports" is allowed to change, because of changing DVA_X across years. As it is seen in the second row of the Table 4, "wage-share of exports" has decreased by 13 percent from 1995 to 2008. This means that even if there was no change in the composition

[3] See equation 3.

of exports, average "wage-share of export" would have decreased from 29.44 to 25.60. In order to clarify the role of the change in the composition of exports in the decrease of the "wage-share of exports", average "wage-share of export" is calculated with changing export composition but constant DVA_X for 1995. As it can be seen from the row 3 of Table 4, there is now an increase in the average "wage-share of export". It can be interpreted as, if the DVA_X was constant for the relevant time period, average "wage-share of exports" would have increased. This increase is a signal for the changing composition of exports in favor of the sectors that have higher "wage-share of exports". As a result, we can say that a fall in DVA_X dominates the effect of changing sectoral composition of export in favor of higher average "wage-share of export" and, therefore, the export share weighted average "wage-share of exports" has decreased.

Table 4
Average Wage-share of Exports

	1995	2000	2005	2008
Wage-share of export	29.44	27.84	26.87	25.37
Wage-share with constant export share (1995)	29.44	27.83	26.6	25.60
Wage-share with constant DVA_X (1995)	29.44	29.80	30.79	31.09

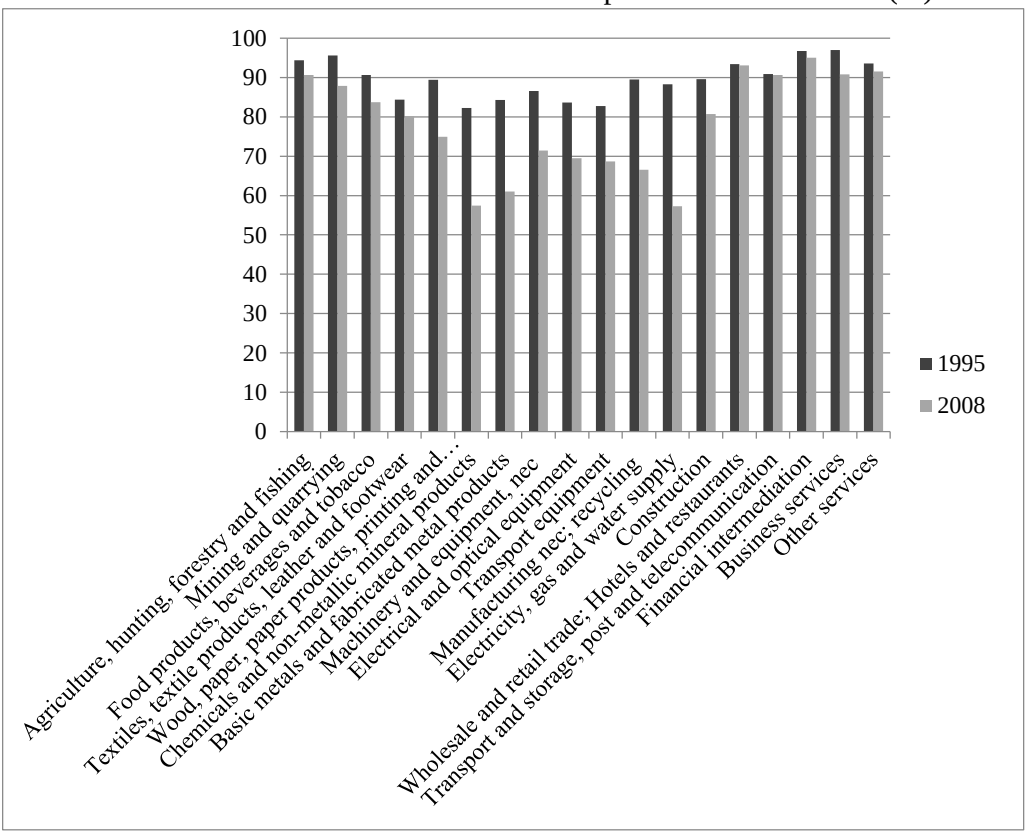
Source: Our calculations based on the OECD-WTO, TURKSTAT data.

Additionally, Spearman's rank correlation coefficient between export composition and "wage-share of exports" is calculated to analyze whether the sectors that have higher share in exports have higher "wage-share of exports" as well. Increase in the Spearman's rank correlation coefficient dynamically can be an indicator of the changing composition of exports in favor of the sectors that have higher "wage-share". Spearman's rank correlation coefficients are -0.3, 0.11, 0.39 and 0.21 for the years 1995, 2000, 2005 and 2008 respectively. The negative coefficient for the year 1995 shows that there is no positive correlation between the rankings of composition of exports and its "wage-share". However, Spearman's rank correlation coefficients turn into positive for subsequent years. Although the value of all the coefficients are not big enough to be statistically significant, the increase in the value of the coefficient between the years 1995 and 2005 shows that there was a change in the composition of exports in favor of the sectors that have a higher "wage-share". This finding confirms the results that we obtained in Table 4.

In sum, the main finding of this part of the study is that the average employment generation capacity of exports within the period 1995-2008 has fallen by 13 percent in Turkey (Row 1 of Table 4). It seems that, fall in the domestic

value added of exports (DVA_X) at every sector is the main reason of this weakening potential of exports in terms of job creation (Figure 1).

Figure 1
Domestic Value added Share of Gross Exports at Sectoral Level (%)

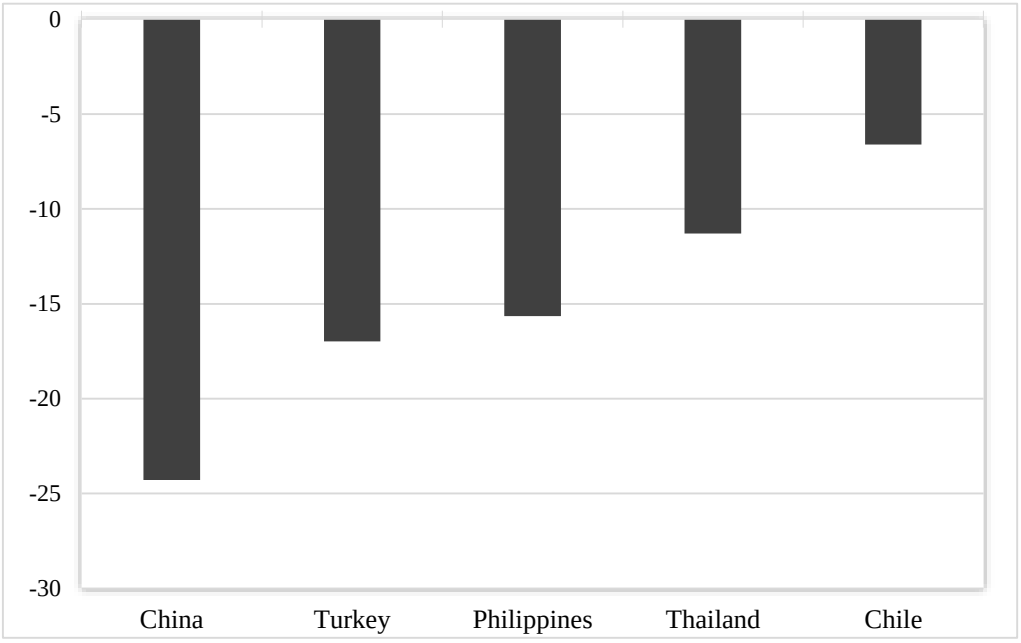


Source: OECD-WTO, TiVA Statistics, 2013.

Figure 2 shows the decrease in the domestic value added share of gross exports for 5 developing countries that experienced the highest decrease in domestic value added of exports between the years 1995 and 2008. Turkey has experienced the second highest decrease in domestic value added of exports after China and this indicates how dramatic is the decrease in domestic value added of Turkey compared to other developing countries. [4]

[4] Among the 56 countries where data are avaliable, Norway, UK, Malasia, Malta, Russian Federation and Hong Kong are the only countries where domestic Value Added Share of Gross Exports have increased from 1995 to 2008.

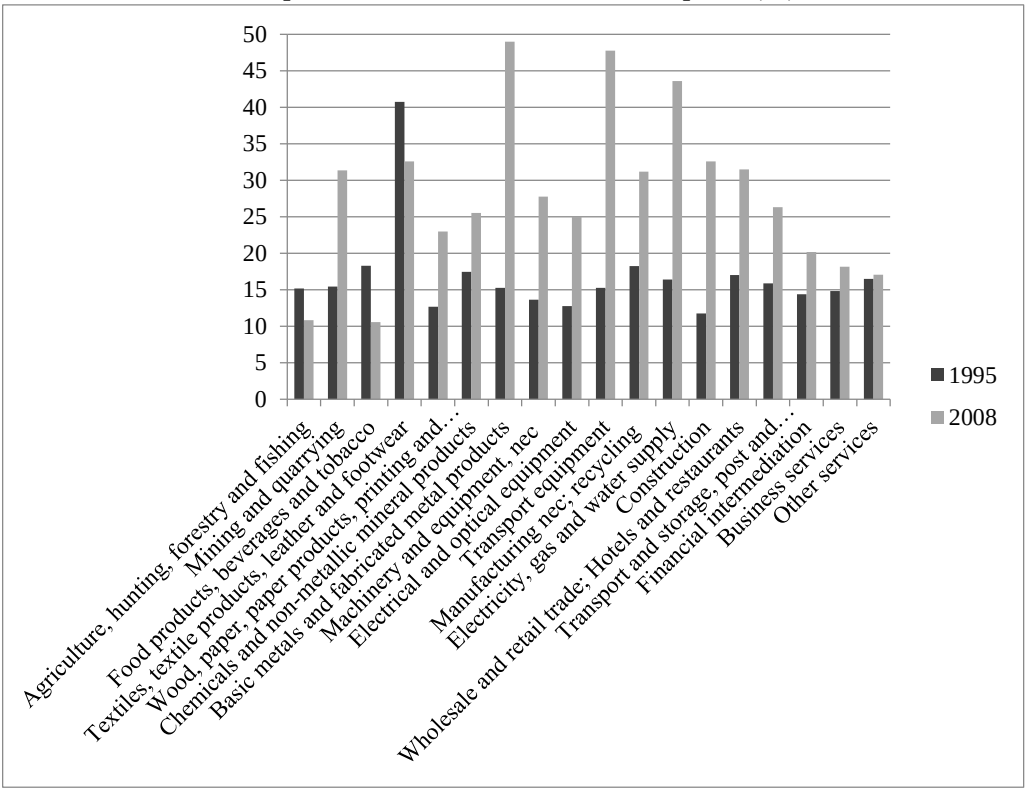
Figure 2
Change in Total domestic Value Added Share of Gross Exports for Selected Developing Countries (1995-2008, %)



Source: Calculated based on the OECD-WTO, TiVA Statistics, 2013.

The increase in the import content at all stages of production can be the main factor for this pattern. There are evidences supporting this idea. In the manufacturing sector, while the share of imported inputs within the output was 36 point in 1997, it increased to 76 point in the year 2007 (Yükseler and Türkan, 2006). Similarly, the share of intermediate imports that are used in producing goods and services for export as a percentage of total intermediate import has increased from 17.42% in 1995 to 26.78% in 2005 and then to 31.42% in 2008 (OECD/WTO, TiVA Statistics, 2013). Figure 3 shows that share of intermediate imports that are used in producing goods and services for export has increased in all sectors except agriculture, food products and textile sectors, from 1995 to 2008.

Figure 3
Share of Intermediate Imports Used in Producing Goods and Services for Export as a percent of Total Intermediate Imports (%)



Source: OECD-WTO, TiVA Statistics, 2013.

Particularly, the three sectors that have the highest share in exports in 2008 experienced the highest increase in the intermediate import share; Basic metals and fabricated metal products (212%), Electrical and optical equipment (95%), Machinery and equipment (103%) (OECD-WTO TiVA Statistics, 2013). These figures show the growth in the fragmentation of production in export sectors with a large amount of intermediate inputs imported from other countries. Similarly, between the periods 2003-2007, 51 percent of exports are realized under the regime of the processing export (Sayılgan and Şenol, 2010:44). In the same vein, within the scope of processing export regime, one-dollar cost of export uses 0.46 dollar cost of import for the same period (Sayılgan and Şenol, 2010:44). Hence, import content of both production and export increased considerably and reached very high levels for the period under consideration.

The second finding of our analysis is the decreasing average "wage-share" of exports in spite of the changing composition of exports in favor of the sectors where the "wage-share" is relatively high (Table 4). The fall in real cost of labor particularly after the 2001 crisis can explain such a shift in the export composition especially for the period 2000-2005. The unit labor cost index for manufacturing sector has fallen from 107.2 to 75.6 in 2001 and to 101.4 in 2005 (Yükseler and Türkan, 2006). During the period 1995-2008 share of textile exports decreased by half while the share of basic metals and fabricated metal products roughly doubled. Also there was a rise in the share of machinery and equipment and transport equipment sector. Rising unit labor costs of production in the textile products sector and falling in unit labor costs in the basic metals and fabricated metal products sector and transport equipment sectors are probably the main reason for this shift in the composition of exports (Yükseler and Türkan 2006; Table 2).

To make further descriptive analyses of the dynamic changes in the value added and employment generation capacity of exports in the Turkish economy for the recent years, firm level data is employed for the years 2002 and 2013. With this aim, Tables 5 and 6 are constructed by using the related indicators: labor per unit of output (L/Q), value added per unit of output (VA/Q) and, imported intermediate inputs per unit of output (Minput/Q).

According to Table 5, the value added has decreased in 36 sectors out of 49 for the average of exporter firms from 2003 to 2012. On average the decrease in the direct value added generated by exporters is negligibly higher than the decrease in value added observed for the average non-exporter firms (Table 5, Table 6). But still the average level of value added for exporters is slightly higher than the one for non-exporters in 2003 and 2012. However, for main export sectors, average value added created by non-exporters firms are higher than that created by exporters in 2012 (Table 5, Table 6). Therefore, for the Turkish economy it is not easy to say that exporters have higher value added or productivity. Moreover, it can be concluded that value added of exporter firms has been decreasing fast especially in some manufacturing industry sectors that contribute to exports more.

The firm level data provides us with similar picture for the labor content of output for the period between 2003 and 2012. Although for 42 of the sectors the labor content of output decreased for exporters, the average decrease is considerably lower for exporters than the decrease observed for non-exporters for the same period (Table 5, Table 6). Despite this relatively slow fall in the labor content of output for exporters, still the labor content of output is lower in most of the sectors for exporters. However, this difference in the rate of change in the fall of labor content of output between exporter and non-exporter firms shows that Turkish exporters do not prefer to decrease labor content of output to keep the comparative advantage of their products.

Table 5

Selected Indicators for Exporter Firms

	L/Q		VA/Q		Minput/Q		ΔL/Q	ΔVA/Q	ΔMinput/Q
Sectors	2003	2012	2003	2012	2003	2012		(2003-2012)	
10	0.0000066	0.0000103	0.4754875	0.2421990	0.0058390	0.0247180	0.0000037	-0.2332885	0.0188790
11	0.0000047	0.0000019	0.4540335	0.5069799	0.0298421	0.0793450	-0.0000028	0.0529464	0.0495029
13	0.0000078	0.0000021	0.5235314	0.6478718	0.0502641	0.0230186	-0.0000057	0.1243404	-0.0272455
14	0.0000099	0.0000042	0.4762245	0.4614424	0.0278304	0.0109949	-0.0000058	-0.0147820	-0.0168355
15	0.0000055	0.0000024	0.2285168	0.1522515	0.0391218	0.0728406	-0.0000031	-0.0762653	0.0337188
16	0.0000040	0.0000010	0.2264946	0.2983891	0.1369968	0.1457846	-0.0000029	0.0718945	0.0087878
17	0.0000117	0.0000054	0.2538158	0.1999759	0.1443765	0.1656418	-0.0000064	-0.0538399	0.0212653
18	0.0000130	0.0000069	0.2441304	0.1838428	0.1587347	0.0755106	-0.0000061	-0.0602876	-0.0832241
19	0.0000105	0.0000067	0.2391845	0.1863765	0.2512850	0.1387772	-0.0000038	-0.0528080	-0.1125078
20	0.0000068	0.0000026	0.2624440	0.2474066	0.1675643	0.2388118	-0.0000042	-0.0150374	0.0712475
21	0.0000068	0.0000027	0.2368086	0.1942621	0.2410176	0.2409396	-0.0000041	-0.0425465	-0.0000780
22	0.0000058	0.0000046	0.3220875	0.2557830	0.0747203	0.0741172	-0.0000013	-0.0663046	-0.0006031
23	0.0000006	0.0000001	0.1155317	0.0425921	0.1151961	0.2079295	-0.0000005	-0.0729395	0.0927334
24	0.0000035	0.0000019	0.2716816	0.2039616	0.6234280	0.4710193	-0.0000016	-0.0677200	-0.1524088
25	0.0000067	0.0000033	0.2982273	0.2054648	0.2658937	0.2803290	-0.0000034	-0.0927624	0.0144353
26	0.0000076	0.0000041	0.3112390	0.2853669	0.0710380	0.0711284	-0.0000035	-0.0258721	0.0000904
27	0.0000036	0.0000012	0.2337324	0.1006541	0.8491153	0.7471793	-0.0000025	-0.1330784	-0.1019360
28	0.0000096	0.0000043	0.2504020	0.1991880	0.2101312	0.1252837	-0.0000053	-0.0512140	-0.0848475
29	0.0000074	0.0000039	0.2746050	0.2295615	0.1949415	0.1484433	-0.0000036	-0.0450435	-0.0464981
30	0.0000026	0.0000017	0.1630316	0.1402681	0.1343730	0.1751771	-0.0000008	-0.0227635	0.0408041
31	0.0000079	0.0000033	0.2801451	0.2031750	0.2645779	0.2477742	-0.0000046	-0.0769701	-0.0168037
32	0.0000043	0.0000025	0.2505470	0.1850981	0.3054437	0.3570444	-0.0000018	-0.0654489	0.0516007
33	0.0000107	0.0000060	0.3636048	0.2942391	0.4826168	0.1918281	-0.0000047	-0.0693657	-0.2907887
34	0.0000041	0.0000023	0.2747879	0.1835146	0.9614110	0.3509424	-0.0000019	-0.0912733	-0.6104686
35	0.0000109	0.0000035	0.3286267	0.3108352	0.2595886	0.2673170	-0.0000075	-0.0177914	0.0077284
36	0.0000113	0.0000057	0.2878615	0.1983768	0.3506180	0.1352848	-0.0000056	-0.0894847	-0.2153332
37	0.0000014	0.0000022	0.0546674	0.0721147	0.0737520	0.1394198	0.0000008	0.0174473	0.0656678
40	0.0000037	0.0000005	0.3248451	0.1462458	0.0223429	0.0139581	-0.0000032	-0.1785994	-0.0083848
41	0.0000119	0.0000091	0.6816828	0.2096308	0.0000000	0.0000008	-0.0000028	-0.4720520	0.0000008
45	0.0000068	0.0000037	0.4019096	0.1780435	0.0127324	0.0098321	-0.0000031	-0.2238662	-0.0029003
50	0.0000053	0.0000048	0.6468974	0.4682374	0.2175391	0.3102273	-0.0000005	-0.1786601	0.0926882
51	0.0000074	0.0000038	0.4828045	0.3313653	0.5374773	0.6480001	-0.0000036	-0.1514392	0.1105228

Table 5 (cont'd)

52	0.0000166	0.0000092	0.5018809	0.4365119	0.0855845	0.0330728	-0.0000074	-0.0653690	-0.0525117
55	0.0000205	0.0000090	0.1764618	0.3230498	0.0034178	0.0019123	-0.0000115	0.1465879	-0.0015055
60	0.0000262	0.0000065	0.4533370	0.0610500	0.0398500	0.0075670	-0.0000197	-0.3922870	-0.0322830
61	0.0000084	0.0000021	0.4641349	0.1968302	0.0155492	0.0138712	-0.0000063	-0.2673047	-0.0016780
62	0.0000053	0.0000011	0.2856854	0.2309566	0.0170635	0.0112053	-0.0000042	-0.0547288	-0.0058582
63	0.0000051	0.0000044	0.3983746	0.4928741	0.0046792	0.0032180	-0.0000007	0.0944994	-0.0014612
64	0.0000012	0.0000014	0.2844330	0.3912233	0.0501651	0.0080332	0.0000002	0.1067903	-0.0421319
K	0.0000042	0.0000107	0.2298766	0.3145348	0.0199040	0.0000440	0.0000065	0.0846582	-0.0198600
71	0.0000148	0.0000067	0.2269003	0.3354488	0.0047162	0.0080455	-0.0000081	0.1085485	0.0033293
72	0.0000093	0.0000049	0.4766684	0.4645605	0.0323841	0.0132009	-0.0000044	-0.0121079	-0.0191832
73	0.0000210	0.0000090	0.8182271	0.5037055	0.0186640	0.0445587	-0.0000120	-0.3145217	0.0258947
74	0.0000189	0.0000128	0.4937616	0.4093791	0.0023181	0.0031901	-0.0000061	-0.0843825	0.0008721
80	0.0000047	0.0000110	0.5131158	0.5613268	0.0009400	0.0009276	0.0000062	0.0482110	-0.0000124
85	0.0000088	0.0000062	0.2983059	0.5453932	0.0017170	0.0006447	-0.0000026	0.2470873	-0.0010723
90	0.0000107	0.0000123	0.3313524	0.3055262	0.0063490	0.0047783	0.0000016	-0.0258262	-0.0015707
92	0.0000096	0.0000029	0.0580495	0.2517442	0.0023744	0.0083465	-0.0000066	0.1936947	0.0059721
93	0.0000145	0.0000189	0.5179356	0.3627257	0.0055239	0.0052838	0.0000044	-0.1552098	-0.0002401
Average	0.0000086	0.0000051	0.3422059	0.2847256	0.1549186	0.1297249	-0.0000035	-0.0574803	-0.0251937

Source: Calculated by authors by using the firm level data of TURKSTAT

Notes: ***(i)*** Sectors in bold are the top six sectors in export. ***(ii)*** (10) Mining of coal and lignite, extraction of peat; (11) Extraction of crude petroleum and natural gas, service activities incidental to oil and gas extraction excluding surveying (14) Other mining and quarrying (15) Manufacture of food products and beverages (17) M. of textiles (18) M. wearing apparel; dressing and dyeing of fur (19) T. and d. of leather; M. of luggage, handbags, saddlery, harness and footwear (21) M. of paper and paper products (22) Publishing, printing and reproduction of recorded media (23) M. of coke, refined petroleum products and nuclear fuel (24) M. of chemicals and chemical products(25) M. of rubber and plastics products 26 - M. of other non-metallic mineral products (27) M. of basic metals (28) M. of fabricated metal products, except machinery and equipment (29) M. of machinery and equipment n.e.c. (30) M. of office, accounting and computing machinery (31) M. of electrical machinery and apparatus n.e.c. (32) M. of radio, television and communication equipment and apparatus (33) M. of medical, precision and optical instruments, watches and clocks (34) M. of motor vehicles, trailers and semi-trailers (35) M. of other transport equipment (36) M. of furniture; manufacturing n.e.c. (37) Recycling (40) Electricity, gas, steam and hot water supply (41) Collection, purification and distribution of water (45) Construction (50) Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel (51) Wholesale trade and commission trade, except of motor vehicles and motorcycles (52) Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods (55) Hotels and restaurants (60) Land transport; transport via pipelines (61) Water transport (62) Air transport (63) Supporting and auxiliary transport activities; activities of travel agencies (64) Post and telecommunications (K) Real estate, renting and business activities (71) Renting of machinery and equipment without operator and of personal and household goods (72) Computer and related activities (73) Research and development (74) Other business activities (80) Education (85) Health and Social work (90) Sewage and refuse disposal, sanitation and similar activities (92) Recreational, cultural and sporting activities (93) Other service activities.

Table 6

Selected Indicators for Non-Exporter Firms

	L/Q		VA/Q		Minput/Q		ΔL/Q	ΔVA/Q	ΔMinput/Q
Sectors	2003	2012	2003	2012	2003	2012		(2003-2012)	
10	0.0000263	0.0000090	0.4335426	0.4314404	0.0058126	0.0249346	-0.0000174	-0.0021023	0.0191220
11	0.0000090	0.0000014	0.3499083	0.7009851	0.0285658	0.0790940	-0.0000076	0.3510768	0.0505282
13	0.0000190	0.0000055	0.3196744	0.3734438	0.0088860	0.0222435	-0.0000134	0.0537694	0.0133575
14	0.0000147	0.0000065	0.3481899	0.2255878	0.0274710	0.0104213	-0.0000082	-0.1226021	-0.0170497
15	0.0000065	0.0000040	0.1929472	0.1227788	0.0390828	0.0728383	-0.0000025	-0.0701684	0.0337555
16	0.0000209	0.0000076	0.3774529	0.2117810	0.0295450	0.1011360	-0.0000133	-0.1656719	0.0715910
17	0.0000128	0.0000070	0.2635436	0.1919174	0.1443634	0.1656377	-0.0000058	-0.0716262	0.0212743
18	0.0000176	0.0000127	0.2689179	0.2419737	0.1586950	0.0753965	-0.0000049	-0.0269442	-0.0832986
19	0.0000160	0.0000096	0.2634744	0.1954119	0.2512055	0.1372752	-0.0000064	-0.0680625	-0.1139303
20	0.0000206	0.0000088	0.2700785	0.2007356	0.1669001	0.2368150	-0.0000118	-0.0693428	0.0699149
21	0.0000083	0.0000056	0.2470477	0.1719541	0.2409570	0.2386360	-0.0000028	-0.0750936	-0.0023210
22	0.0000110	0.0000060	0.3379340	0.2730779	0.0746228	0.0741077	-0.0000050	-0.0648561	-0.0005151
23	0.0000046	0.0000011	0.2438859	0.0641606	0.1114104	0.2029990	-0.0000035	-0.1797253	0.0915886
24	0.0000057	0.0000033	0.2950149	0.2020438	0.6233830	0.4710120	-0.0000024	-0.0929711	-0.1523710
25	0.0000104	0.0000066	0.2562699	0.1953398	0.2658750	0.2803220	-0.0000039	-0.0609301	0.0144470
26	0.0000114	0.0000056	0.3025176	0.1768964	0.0701520	0.0711240	-0.0000058	-0.1256212	0.0009720
27	0.0000056	0.0000025	0.1899708	0.1160668	0.8347350	0.7471616	-0.0000031	-0.0739039	-0.0875734
28	0.0000138	0.0000079	0.2755630	0.2074158	0.2100350	0.1248534	-0.0000059	-0.0681472	-0.0851816
29	0.0000156	0.0000076	0.3581709	0.2383192	0.1939420	0.1481552	-0.0000080	-0.1198516	-0.0457868
30	0.0000009	0.0000007	0.0300420	0.0302083	0.1209130	0.0556701	-0.0000001	0.0001663	-0.0652429
31	0.0000138	0.0000058	0.2383485	0.1718880	0.2627690	0.2462680	-0.0000080	-0.0664605	-0.0165010
32	0.0000031	0.0000080	0.1535110	0.2254472	0.3052980	0.3566005	0.0000049	0.0719362	0.0513025
33	0.0000142	0.0000120	0.3231645	0.3144803	0.4812500	0.1904031	-0.0000022	-0.0086842	-0.2908469
34	0.0000142	0.0000061	0.3193873	0.1782481	0.9398330	0.3411690	-0.0000081	-0.1411391	-0.5986640
35	0.0000094	0.0000104	0.2553434	0.2911819	0.2593482	0.2672550	0.0000009	0.0358386	0.0079068
36	0.0000180	0.0000102	0.3247832	0.2231716	0.3496328	0.1322450	-0.0000078	-0.1016115	-0.2173878
37	0.0000045	0.0000017	0.0771216	0.0586867	0.0733490	0.1393691	-0.0000028	-0.0184350	0.0660201
40	0.0000017	0.0000006	0.1493398	0.1226704	0.0223404	0.0139575	-0.0000011	-0.0266694	-0.0083829
41	0.0000094	0.0000030	0.6624124	0.5413837	0.0143772	0.0015098	-0.0000063	-0.1210287	-0.0128674
45	0.0000096	0.0000065	0.3018608	0.1470592	0.0127273	0.0098332	-0.0000031	-0.1548016	-0.0028941
50	0.0000183	0.0000104	0.6475119	0.3845168	0.2175352	0.3101328	-0.0000079	-0.2629951	0.0925976
51	0.0000152	0.0000080	0.6286185	0.3707705	0.5374676	0.6471590	-0.0000072	-0.2578480	0.1096914

Table 6 (cont'd)

52	0.0000287	0.0000175	0.5354893	0.4208561	0.0851999	0.0330726	-0.0000111	-0.1146332	-0.0521273
55	0.0000242	0.0000126	0.3039041	0.3585236	0.0034210	0.0019099	-0.0000116	0.0546195	-0.0015111
60	0.0000078	0.0000052	0.2576268	0.1856251	0.0398476	0.0076451	-0.0000026	-0.0720018	-0.0322026
61	0.0000049	0.0000025	0.2507870	0.2895789	0.0152616	0.0084420	-0.0000024	0.0387919	-0.0068196
62	0.0000018	0.0000024	0.1562304	0.0981644	0.0118078	0.0105726	0.0000007	-0.0580660	-0.0012353
63	0.0000090	0.0000043	0.3403400	0.2315009	0.0046975	0.0028881	-0.0000047	-0.1088390	-0.0018095
64	0.0000145	0.0000069	0.5268619	0.3191812	0.0501672	0.0078975	-0.0000076	-0.2076807	-0.0422697
K	0.0000037	0.0000027	0.3341047	0.1943256	0.0085850	0.0014750	-0.0000010	-0.1397791	-0.0071100
71	0.0000106	0.0000038	0.3912227	0.4322347	0.0046460	0.0081290	-0.0000068	0.0410121	0.0034830
72	0.0000132	0.0000073	0.6169730	0.4655315	0.0322901	0.0132448	-0.0000059	-0.1514414	-0.0190453
73	0.0000143	0.0000071	0.3365351	0.4463869	0.0058370	0.0450970	-0.0000072	0.1098518	0.0392600
74	0.0000293	0.0000191	0.4177795	0.4779384	0.0022997	0.0031488	-0.0000102	0.0601589	0.0008491
80	0.0000363	0.0000196	0.6187135	0.6110945	0.0009958	0.0007541	-0.0000167	-0.0076189	-0.0002418
85	0.0000199	0.0000131	0.3752072	0.4880537	0.0017497	0.0006599	-0.0000068	0.1128465	-0.0010898
90	0.0000341	0.0000160	0.3376236	0.4810950	0.0087500	0.0047099	-0.0000181	0.1434714	-0.0040401
92	0.0000098	0.0000051	0.4336423	0.3095925	0.0043734	0.0083463	-0.0000047	-0.1240497	0.0039729
93	0.0000448	0.0000215	0.4482709	0.3634257	0.0067648	0.0050782	-0.0000233	-0.0848452	-0.0016866
Average	0.0000141	0.0000075	0.3344257	0.2811051	0.1503913	0.1256899	-0.0000065	-0.0533206	-0.0247014

Source: Calculated by authors by using the firm level data of TURKSTAT

Notes: ***(i)*** Sectors in bold are the top six sectors in export. ***(ii)*** (10) Mining of coal and lignite, extraction of peat; (11) Extraction of crude petroleum and natural gas, service activities incidental to oil and gas extraction excluding surveying (14) Other mining and quarrying (15) Manufacture of food products and beverages (17) M. of textiles (18) M. wearing apparel; dressing and dyeing of fur (19) T. and d. of leather; M. of luggage, handbags, saddlery, harness and footwear (21) M. of paper and paper products (22) Publishing, printing and reproduction of recorded media (23) M. of coke, refined petroleum products and nuclear fuel (24) M. of chemicals and chemical products(25) M. of rubber and plastics products 26 - M. of other non-metallic mineral products (27) M. of basic metals (28) M. of fabricated metal products, except machinery and equipment (29) M. of machinery and equipment n.e.c. (30) M. of office, accounting and computing machinery (31) M. of electrical machinery and apparatus n.e.c. (32) M. of radio, television and communication equipment and apparatus (33) M. of medical, precision and optical instruments, watches and clocks (34) M. of motor vehicles, trailers and semi-trailers (35) M. of other transport equipment (36) M. of furniture; manufacturing n.e.c. (37) Recycling (40) Electricity, gas, steam and hot water supply (41) Collection, purification and distribution of water (45) Construction (50) Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel (51) Wholesale trade and commission trade, except of motor vehicles and motorcycles (52) Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods (55) Hotels and restaurants (60) Land transport; transport via pipelines (61) Water transport (62) Air transport (63) Supporting and auxiliary transport activities; activities of travel agencies (64) Post and telecommunications (K) Real estate, renting and business activities (71) Renting of machinery and equipment without operator and of personal and household goods (72) Computer and related activities (73) Research and development (74) Other business activities (80) Education (85) Health and Social work (90) Sewage and refuse disposal, sanitation and similar activities (92) Recreational, cultural and sporting activities (93) Other service activities.

Another striking fact that the firm level data shows, which seems to be contrasting with the analysis base on the data released by OECD-WTO for the period 1995-2008, is the falling average imported intermediate input content of output both for exporter and non-exporter firms by almost 16% within the period 2003-2012 (Table 5 and Table 6). According to the Table 5, imported intermediate input content of output have decreased in 29 sectors out of 49 for the exporter firms from 2003 to 2012. In four of the sectors that have the six highest shares in export, intermediate input content of output have decreased for the exporter firms between the years 2003 and 2012**.** This result seems to contradict with the OECD-WTO data. This might be due to the difference in the time period of our analysis and the OECD-WTO data (i.e 1995-2008 versus 2003-2012). It may also point to changing trends in terms of imported intermediate inputs usage of the Turkish manufacturing sector after the 2008 financial crisis. Furthermore, this seemingly contradictory result may come from the caveats of the method used by WTO-OECD while calculating "domestic value added share of gross export" statistics. There are two crucial assumptions of this method. These are "production" and "proportionality" assumptions (OECD, 2015). According to the production assumption, both exporter firms and firms producing for domestic markets use the same techniques of production. In other words, it is assumed that both types of firm have the same input-output ratios and the same imported intermediate input ratio. Moreover these input-output ratios rely on the latest released input-output table of related country, namely year 2002 for Turkey. So, the techniques of production have also been assumed to stay constant since the year 2002. The proportionality assumption suggests that the proportion of intermediates that an industry purchases from abroad is equal to the ratio of imports to total domestic demand in that product. However, in the analysis based on firm level data, first we use the differentiated data for exporting firms and firms producing for domestic market, and second we employ the imported inputs for both types of firms separately for each year. Therefore, firm level data does not rely on the production and proportionality assumptions. Therefore, it can be claimed that the firm level data analysis is more robust and reliable.

When we evaluate the decrease in direct value added as well as the decrease in the imported intermediate input content both by exporters and non-exporters together one can say that there was an increase in the domestic intermediate input content of output both for exporters and non-exporter firms from 2003 to 2012**.** In other words, even though there is an increase in the total intermediate input content of output, as it is implied by the decrease in direct value added content of output, the decrease in the imported intermediate input content of output shows that domestic intermediate goods substitutes the imported intermediate goods. This

might be due to the change in the production techniques in favor of using more domestic inputs in recent years.

Even though the share of exporter firms in the total intermediate import has increased by 7.5% from 2003 to 2012[5], decrease in the intermediate input content of output by exporter firms in recent years have also important implications in terms of the indirect value added as well as the employment generation capacity of export. In other words, depending on the intensity of inter-sectoral linkages there might have been an increase in the indirect domestic value added and employment generated by exports in Turkey in recent years. However it is not possible to reach a concrete result at this stage since there is no input-output table available either for related periods or for export production.

5. Conclusion

As a result of globalization the share of the sum of imports and exports to the world GDP increased from 39% in 1980 to 61.5% in 2013 (UNCTAD, 2015). In keeping with the overall trend in the world, the X/GDP ratio increased from 19.89% in 1995 to 25.64% in 2013 for the Turkish economy. Higher growth in exports was accompanied by higher GDP growth. In contrast to the positive performance of the Turkish economy in terms of exports and GDP, the unemployment rate has an increasing trend with very high rates during the same period. These facts make us question the role of increasing exports in employment generation for Turkish economy. For this purpose, input-output modeling is preferred for further analysis. Input-output modeling provides the necessary information to observe the direct and indirect domestic value added of exports. By this means the whole effect of exports on domestic economy, together with the inter-sectoral linkages, are obtainable. Also an input-output table makes it possible to see the relation between value added and wage content in value added. Consequently it becomes possible to measure the "wage-share of export" as a proxy for the labor demand that can be created by one unit of export.

According to our estimations the average "wage-share" and, therefore, the average labor demand of one unit of export has decreased between the years 1995-2008. The falling domestic value added component of exports is responsible for this weakening role of exports in employment generation. Certainly, the increasing imported input content of both the domestic and export goods production process is the main cause of the drop in the domestic value added. Another finding of our study is that the composition of exports shifted towards the sectors where "wage-share of export" is relatively high. However, this shift could not compensate the fall in "wage-share of exports". Our study also implies that Turkey's integration into

[5] Our calculations based on the firm level data collected by TURKSTAT.

the world economy is becoming more and more as an exporter of processing industries. This result has many indications not only in terms of unemployment but also in terms of the industrialization strategy of Turkey. Figure 3 indicates that the Turkish economy is locked into the GVCs at the bottom of the so-called smile curve.[6] However, as it is pointed out by the OECD, WTO and World Bank (2014), the benefits of the GVCs depends on whether a country operates at the high or low end of the value chain. Therefore, effective industrial policies should be designed to move up from low end to high end of the value chains.

The firm level data reveals similar results for the period 2003-2012. There is a decrease in the direct value added generated by both exporters and non-exporters and the decrease in average value added is higher for exporters firms. For many of the leading sectors of exports, average direct value added created by non-exporter firms is higher than that of exporters. Therefore, it can be said that exporter firms are not more productive than non-exporter firms. In other words, Turkish firms do not obtain comparative advantage by means of productivity.

Although the value added created by Turkish exporters are decreasing, and hence its potential for employment generation is weakening, in terms of labor content of production the picture is not so clear. The tendency of change in exporting firms' production techniques is not the same as in non-exporter firms' production techniques. The propensity to decrease in labor content of production is lower for exporting firms than non-exporting firms. Additionally, the decrease in the intermediate input content of output by exporter firms in recent years might have caused increases in the indirect domestic value added and employment generated by exports in Turkey. This result that seems to contradict with the inferences obtained from calculations by using the OECD-WTO data might be due to the difference in the time period of our analysis and the OECD-WTO data as well as the method used by WTO-OECD while calculating "domestic value added share of gross export" statistics. Firm level data analysis shows imported intermediate input usage of firms exporting and producing for domestic market has decreased especially for the years after the crisis year of 2008. It may be a signal of rising domestic value added for both types of firms in the future.

It is assumed that technology and foreign input requirement of firms producing for domestic market and for exporting are the same in the estimation that we made by using TiVA of OECD-WTO and Turkish input-output table. However, as it is mentioned before, this method may give biased estimations. For this reason,

[6] Smile curve that was introduced by Acer founder and CEO Stan Shih in the early 1990s show that the share of value added in manufactured products is shifting from the fabrication stages to pre and post-fabrication services (Baldwin et al., 2014).

input-output tables based on firm level data will be constructed as an extension of this study in order to obtain more reliable estimates.

References

AHMAD, N. (2013), "Estimating Trade in Value-added: Why and How? In Global Value Chains in a Changing World", Elms, D.K and Low, P (eds.), *Global Value Chains in a Changing World*, *WTO – FGI – TFCTN*, 85-109.

BALDWIN, R. ITO, T. and SATO, H. (2014), "The smile curve: Evolving Sources of Value Added in Manufacturing", http://www.uniba.it/ricerca/dipartimenti/dse/e.g.i/egi2014-papers/ito.

BERNARD, A. and JENSEN, J. (2004), "Exporting and Productivity in the USA", *Oxford Review of Economic Policy*, 20(3): 343-357

CAPPARIELLO, R. (2012), "Domestic Value Added Content of Exports: a Cross-Country Comparison for the Major European Economies", Paper for Presentation at the Final WIOD Conference "Causes and Consequences of Globalization", www.wiod.org/conferences/groningen/Paper_Capparielloo.pdf.

CHEN, X., L.K. CHENG, K.C. FUNG, L.J. LAU, Y.W. SUNG, K. ZHU, C.YANG, J. PEI, AND Y. DUAN (2012), "Domestic Value Added and Employment Generated by Chinese Exports: A Quantitative Estimation", *China Economic Review*, 23(4): 850–864.

CHEN, X., L. CHENG, K.C. FUNG AND L.J. LAU (2009), "The Estimation of Domestic Value-added and Employment Induced by Exports: An application to Chinese Exports to United States", Wong, K.Y and Cheung, Y.W (eds*), China and Asia*, Routledge.

DE BACKER, K. and N. YAMANO (2007), "The Measurement of Globalization using International Input-Output Tables", OECD Science, Technology and Industry Working Papers, 2007/08, OECD Publishing. http://dx.doi.org/10.1787/242020221356

DEAN, J. M., FUNG, K.C. and WANG, Z, (2007), "Measuring the Vertical Specialization in Chinese Trade", Office of Economics Working Paper No. 2007-01-A, U.S. International Trade Commission.

ELMS, D.K. and LOW, P. (2013), *Global Value Chains in a Changing World*, WTO – FGI – TFCTN.

FEENSTRA, R. C. and HONG, C. (2007), "China's Exports and Employment", NBER Working Paper No. 13552.

GAMBERO, G.F. and MARTINEZ, R. (2013), "Indirect Domestic Value Added in Mexico's Manufacturing Exports, by Origin and Destination Sector", Levy Economics Institute, Working Paper, No. 260.

GÖRG, H. (2011), "Globalization, Offshoring and Jobs", Bacchetta, M. and Jansen, M. (eds), *Making Globalization Socially Sustainable*, World Trade Organization and International Trade Office.

GROSSMAN, G. M. and ROSSI-HANSBER, E. (2008), "Trading Tasks: A Simple Theory of Offshoring", *American Economic Review*, 2008, 98:5, 1978–1997.

HOEKMAN, B. and WINTERS, L.A. (2005), "Trade and Employment: Stylized Facts and Research Findings", DESA Working Paper No. 7.

HUMMELS, D., ISHII, J. and YI, K. (2001), "The Nature and Growth of Vertical Specialization in World Trade", *Journal of International Economics,* 54:75–96.

ILO (2015), "World Employment and Social Outlook, Trends in 2015", http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_337069.pdf

IMF (2013), "Trade Interconnectedness: the World with Global Value Chains", http://www.imf.org/external/np/pp/eng/2013/082613.pdf.

JIANG, X. (2013) "Trade and Employment in a Vertically Specialized World" ILO Research Paper No.5, ILO, http://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_ 211506.pdf

JIANG, X., and MILBERG, W (2013), "Capturing the Jobs from Globalization: Trade and Employment in Global Value Chains", http://www.capturingthegains.org/pdf/ctg-wp-2013-30.pdf

LALL, S. (2002), "The Employment Impact of Globalization in Developing Countries", QEH Working Paper Series, Number 93.

LEONTIEF, W. (1986) *Input-Output Economics*. New York: Oxford University Press.

KOOPMAN, R., WANG, Z. AND WEI, S, J. (2008), "How Much Chinese Exports Is Really Made in China—Assessing Foreign and Domestic Value-added in Gross Exports" NBER Working Paper, No. 14109, http://www.nber.org/papers/w14109.

KOOPMAN, R., WANG, Z. AND WEI, S, J. (2010), "Give Credit Where Credit Is Due: Tracing Value Added in Global Production Chains", NBER Working Paper, No. 16426.

KOOPMAN, R., WANG, Z. AND WEI, S, J. (2012), "The Value-added Structure of Gross Exports and Global Production Network", Paper for Presentation at the Final WIOD Conference "Causes and Consequences of Globalization" April 24-26, 2012 Groningen, the Netherlands.

MELITZ, M. J. (2003), "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity", *Econometrica*, 71, 1695-1725.

NEWFARMER, R. and SZTAJEROWSKA, M. (2012), "Trade and Employment in a Fast-Changing World", Lippoldt, D. (ed.), *Policy Priorities for International Trade and Jobs*, OECD, Paris

OECD, (2015), TRADE IN VALUE ADDED (TIVA) INDICATORS, GUIDE TO COUNTRY NOTES http://www.oecd.org/sti/ind/TiVA_2015_Guide_to_Country_Notes.pdf

OECD-WTO (2013), "Trade in Value Added (TiVA) - May 2013", http://stats.oecd.org/index.aspx?queryid=47807.

OECD, WTO and WORLD BANK, (2014**), "**Global Value Chains: Challenges, Opportunities, and Implications for Policy", Report prepared for submission to the G20 Trade Ministers Meeting Sydney, Australia, 19 July 2014.

ROJICEK, M. (2009), "The Effects of Export on the Czech Economy: Input-output Approach", 17th International Input Output Conference, http://www.vsem.cz/data/data/ces-soubory/aktualni-vystupy/gf_konference_Sao%20Paulo.pdf.

SAYILGAN, G. and ŞENOL, C. (2010), "Dahilde İşleme rejimi ve Türk İşletmelerinin İhracatı Üzerindeki Etkileri", *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 35: 37-53.

SHINGAL, A. (2015), "Labour Market Effects of Integration into GVCs: Review of Literature", Swiss Programme for Research on Global Issues for Development, Working Paper, 2015/10.

TURKSTAT (Turkish Statistical Institute), *Input-Output Tables*, http://www.turkstat.gov.tr/PreTablo.do?alt_id=1021.

TURKSTAT (Turkish Statistical Institute), *Sectoral Composition of Export Data*, http://tuikapp.tuik.gov.tr/disticaretapp/menu_ing.zul.

UNCTAD, (2013), "Investment and Value Added Trade in the Global Economy", UNCTAD/DIAE/2013/1.

UNCTAD,(2015),UnctadStad, http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sRF_ActivePath=p,15912&sRF_Expanded=,p,15912,.

WORLD BANK, (2015), *Country Data*, http://data.worldbank.org/country/turkey.

YÜKSELER, Z. AND TÜRKAN, E. (2006), "Türkiye'nin Üretim ve Dış Ticaret Yapısında Dönüşüm: Küresel Yönelimler ve Yansımalar", TÜSİAD Koç Üniversitesi, Ekonomik Araştirma Forumu, http://eaf.ku.edu.tr/researchreports.

Özet

Türkiye'de yabancı talep tarafından yaratılan istihdam ve katma değerin dinamik analizi

Bu çalışmanın amacı, ihracatın istihdam yaratma kapasitesindeki son yıllardaki değişimi girdi-çıktı yöntemi kullanarak incelemektir. Bir birim ihracatın içindeki doğrudan ve dolaylı "ücret-payı" 2002 girdi-çıktı tablosu ve sektörel düzeyde Katma Değer Ticareti (TiVA) istatistikleri yardımıyla tahmin edilmiştir. Tahmin sonuçlarımız, bir birim ihracat ürününün yarattığı, istihdamı temsil etmesi için hesaplanan, ortalama ücret içeriğinin 1995-2008 yılları arasında azaldığını göstermektedir. İhracatın azalan yurt içi katma değer içeriği, ihracatın istihdam yaratma kapasitesindeki bu düşmenin nedeni olarak gözükmektedir. Firma düzeyindeki veriler de, ihracatın istihdam ve dolaysız katma değer üzerindeki etkileri çerçevesinde 2003-2012 dönemi için benzer sonuçlara işaret etmektedir. Buna karşın firma düzeyindeki veriler, son yıllarda ihracat yapan firmaların üretimde kullandıkları ithal girdi oranındaki azalmalar nedeniyle, ihracatın dolaylı katma değer ve istihdam yaratma kapasitesinde bir artışın gerçekleşebilme olasığını gündeme getirmektedir.

Anahtar kelimeler: İhracat, yurt içi katma değer, istihdam, girdi-çıktı analizi.

Jel kodları: D57, F14, F15, F16, F66.